**Enhancing Biosecurity Oversight in Malaysia with Dual Use Case Studies**

**Participant Packet**

**Case study exercise:**

Song Y et al. (2017) Limits of variation, specific infectivity, and genome packaging of massively recoded poliovirus genomes.

This case study exercise was developed by Gryphon Scientific and the Science and Technology Research Institute for Defence (STRIDE) for the workshop titled “Workshop on Enhancing Biosecurity Oversight in Malaysia with Dual Use Case Studies”

Materials were adapted from International Engagement: Secure Science, Technology, and Research - BMENA Case Studies by American Association for the Advancement of Science’s Center for Science, Technology and Security Policy (AAAS CSTSP), licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 United States License

* International Engagement: Secure Science, Technology, and Research - BMENA Case Studies: <https://www.aaas.org/report/BMENA-risk-analysis-training>
* License: <https://creativecommons.org/licenses/by-nc-sa/3.0/us/>

This work is licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License

* License: https://creativecommons.org/licenses/by-nc-sa/4.0/

**Worksheet**

**Risk Analysis Framework for Case Study Article:**

Song Y et al. (2017) Limits of variation, specific infectivity, and genome packaging of massively recoded poliovirus genomes. *Proc Natl Acad Sci U S A. 114 (41): E8731-E8740.*

**Risk Identification**

What, if any, are the risks in designing a modified poliovirus genome?

What, if any, are the risks of using computational design before laboratory studies?

What, if any, are the risks of the methodology for chemical synthesis of poliovirus?

What, if any, are the risks associated with information on poliovirus’s tolerance to genome changes?

What, if any, are the potential biosafety risks to the researchers?

What, if any, are the potential biosafety risks to the public?

What, if any, are the biosecurity risks associated with the information, methods, and materials generated in this study?

**Risk Assessment**

What are the harms that may arise from the identified risks?

Which risks are most immediate? Which risks are more distant?

Which risks pose the greatest harms (greatest health, ethical, reputational, other harms)?

Do the risks appear to outweigh the benefits?

**Risk Management**

What best practices in performing this study may help to manage biosecurity, biosafety, or other risks?

What training may help to mitigate or manage biosecurity, biosafety, or other risks?

What safety measures and controls may help to mitigate or manage biosecurity, biosafety, or other risks?

What other risk management procedures could minimize the most concerning risks of this study without compromising scientific utility or quality?

**Risk Communication**

What risks should be communicated before, during, and after the research?

To whom should these risks be communicated?

How can these risks be communicated effectively?

How should risk mitigation strategies be communicated to interested audiences?

Are risks associated with the communication of results or methods of this study?

If so, what are the potential approaches for addressing this risk?

**Reflection**

Think about how to apply the risk analysis framework to your own research, using a past, current, or planned project. The questions below may help guide your thinking, in combination with other factors specific to your project:

1. **Risk Identification** - What are the risks associated with this research?
2. **Risk Assessment** - What are the harms that may arise from the identified risks? What are the severities of these harms? How do the risks compare to the benefits?
3. **Risk Management** - What approaches can prevent the occurrence of the identified risks or minimize consequences if these risks occur? How can risk management approaches be implemented to effectively minimize risk without compromising scientific utility and quality?
4. **Risk Communication** - How should the risks of the study be communicated to appropriate audiences? What risks must be communicated? To whom should the risks be communicated? How should risk mitigation strategies be communicated? If risk exists in sharing the results of the study, how can findings be communicated responsibly?